

Photoinitiated-curing acrylates		DELO-PHOTOBOND													DELO-DUALBOND				
		UV-curing		UV- and light-curing											light- and humidity-curing			UV-/light-/heat-curing	
Product code		GB310	GB345	GB368	PB437	4494	AD491	4436	4442	4468	4496	4497	AD414	AD494	SD496	AD4950	GE4910	AD4930	AD465
Application area (B = bonding, S = sealing, C = coating)		B	B	B	B	B	K	B	B/S	B	B/S	B/S/C	B/S	B	K	B/S	B/S	B/S	B/S
Color cured product	in 0.1 mm layer thickness	colorless clear	colorless clear	colorless clear	colorless clear	colorless clear	colorless translucent	colorless clear	colorless clear	colorless clear	colorless clear	milky	blue fluorescent	colorless clear	blue fluorescent	colorless clear	colorless clear	colorless clear	red fluorescent
	in 1.0 mm layer thickness	colorless clear	colorless clear	colorless clear	colorless clear	colorless clear	colorless translucent	colorless clear	colorless clear	colorless clear	yellowish clear	milky	blue fluorescent	yellowish clear	blue fluorescent	yellowish clear	yellowish clear	yellowish clear	red fluorescent
Viscosity [mPas] (+23 °C) Brookfield	DIN EN 12092	100	1,500	5,700	8,000 thix	20,000 thix	90,000	350	650	7,000 thix	17,000 thix	30,000 thix	1,300	50,000 thix	58,000	36,000	2,000	14,000	24,000
Wavelength range for curing [nm]		← 320 – 400 →		← 320 – 420 →				← 320 – 450 →											320 – 420
Minimum irradiation time [s] DELOLUX 04, DELO Standard 23	at 55 – 60 mW/cm ² UVA intensity ³⁾	20	17	15	6	7	7	8	60	40	50	15	17	14	11	10	10	5	4
Heat curing time [min] without heating time of components, at +130 °C		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3
Compression shear strength [MPa] DELO Standard 5 Irradiation and curing conditions: DELOLUX 03 S, layer thickness 0.1 mm; lamp distance approx. 70 mm; UVA intensity ³⁾ 55 – 60 mW/cm ² irradiation time 60 s; approx. 23 °C	glass/glass	34	29	23	31	28	25	18	4	22	6	19	7	13	11	9	7	9	23
	glass/Al	40	27	23	30	25	25	17	4	24	4	19	8	12	6	6	6	4	22
	glass/PC	4	7	7	14	15	18	7	5	3	5	10	–	13	5	–	–	–	–
	glass/PMMA	4	–	16	8	4	8	4	3	3	4	3	–	9	6	–	–	–	–
	PC/Al	– ¹⁾	– ¹⁾	5	9	5	14	2	2	3	5	4	–	10	3	–	–	–	–
PC/PC	– ¹⁾	– ¹⁾	6	22	18	28	10	6	1	10	12	6	18	20	10	–	–	–	–
PMMA/PMMA	– ¹⁾	– ¹⁾	15	9	10	12	4	2	3	3	7	–	–	10	8	–	7	–	
Tensile strength [MPa]	DIN EN ISO 527	33	26	20	21	20	20	12	3	14	6	11	8	13	7	8	6	5	17
Elongation at tear [%]	DIN EN ISO 527	4	40	17	110	160	150	250	300	200	300	200	540	310	200	270	315	45	220
Young's modulus [MPa]	DIN EN ISO 527	1,600	1,200	900	520	400	400	35	– ²⁾	250	– ²⁾	84	–	20	20	45	17	30	320
Shore hardness	DIN EN ISO 868	D 77	D 70	D 67	D 65	D 62	D 63	D 38	A 30	D 45	A 35	D 40	A 44	D 25	D 25	A 77	A 62	A 80	D 50
Glass transition temperature [°C]	rheometer	120	77	102	114	100	100	57	18	74	21	52	28	48	45	70	70	65	100
Average coefficient of linear expansion [ppm/K]	TMA, in temperature range: +25 °C to +140 °C	168	214	236	184	211	180	247	254	216	239	208	260	200	268	217	235	210	204
Shrinkage [vol. %]	DELO Standard 13	10	7	7	9	9	7.5	10	6	9	6	9	6.3	7	8	4.6	5	3	5.6
Water absorption [weight %]	by the criteria of DIN EN ISO 62 24 h at +23 °C	0.4	0.9	0.5	1.0	1.3	1.0	0.9	0.6	0.9	0.7	0.9	0.7	3	1,9	2.5	1.3	0.6	1.2
Special features of product	glass adhesive capillary high-strength		glass-to-metal connections	glass adhesive also for glass-to-plastic connections dry surface	multi-purpose adhesive very fast curing tough-hard	multi-purpose adhesive tough-hard fast curing	multi-purpose adhesive excellent humidity resistance	multi-purpose adhesive fast curing	flexible sealing USP XXIII Class VI approval	glass and glass-to-metal connections USP XXIII Class VI approval	flexible sealing run-resistant	multi-purpose adhesive dry surface	multi-purpose adhesive good flow properties very good sealing properties	multi-purpose adhesive steady gap-filling	peel-resistant plastic bondings dry surface tension-equalizing	multi-purpose adhesive	multi-purpose adhesive highly flexible good flow properties	multi-purpose adhesive flexible	multi-purpose adhesive dry surface build-up of strength in shadowed areas by heat

AD = ADhesive GB = Glass Bonding GE = General Encapsulant PB = PHOTOBOND SD = Surface Dry

Product description

DELO-PHOTOBOND and DELO-DUALBOND are one-component, solvent-free adhesives based on acrylates. DELO-PHOTOBOND products cure to their final strength within a few seconds by exposure to UVA light or visible light (VIS). DELO-DUALBOND products can additionally be cured by heat or air humidity. This is beneficial where the adhesive is not or only insufficiently accessible to light, for example in shadowed areas. The use of DELO-PHOTOBOND adhesives in the field of glass construction, including façade engineering or overhead applications, requires special building approvals which must be obtained by the users themselves.

Standard temperature range

DELO-PHOTOBOND and DELO-DUALBOND acrylates are normally used in a temperature range of –40 °C to +120 °C. Many product properties depend on the temperature and can permanently change, especially at high temperatures. Therefore, the suitability of the respective adhesive for the intended temperature range of use must be tested according to the application before use. You can find details on the behavior of the products under the influence of elevated temperatures in the respective technical data sheet

Processing

The products are supplied ready for use and can be processed directly from the original container or with dispensing units. You can find more details in the DELO equipment brochure.

Curing

All DELO-PHOTOBOND acrylates immediately achieve complete curing by irradiation with light of the suitable wavelength. Therefore, to bond two components, one has to be permeable to light of the wavelength used for curing.

DELO-PHOTOBOND products are also used for casting and coating applications. After curing, the adhesive surface can remain slightly sticky. The DELO-PHOTOBOND adhesives GB368, 4497, SD496 and AD465 have a dry surface after curing with proper irradiation parameters.

Components bonded with DELO-DUALBOND can quickly be fixed by light curing. Afterwards, complete curing is achieved by humidity or heat curing.

Surface pretreatment

For optimal adhesion, the surfaces to be bonded must be free of oil, grease, separating agents and other contaminations.

Adhesion can be improved by suitable pretreatment methods, such as sand blasting, flaming and plasma or corona treatment. For the cleaning of glass DELOTHEN EP cleaner has proven to be efficient.

Storage life

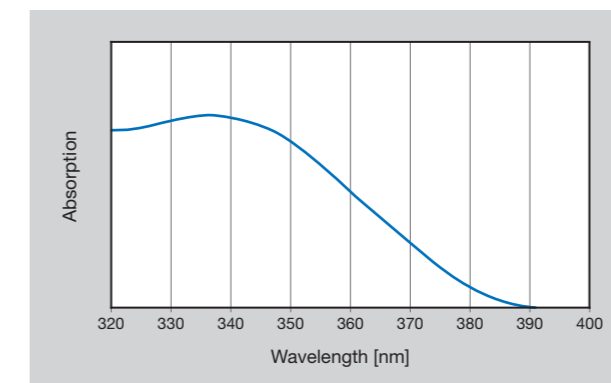
Most DELO-PHOTOBOND products are durable for six months if stored in unopened original container at room temperature. DELO-DUALBOND products are stored at a temperature of 0 °C to +10 °C. You can find detailed information in the technical data sheet.

Further information

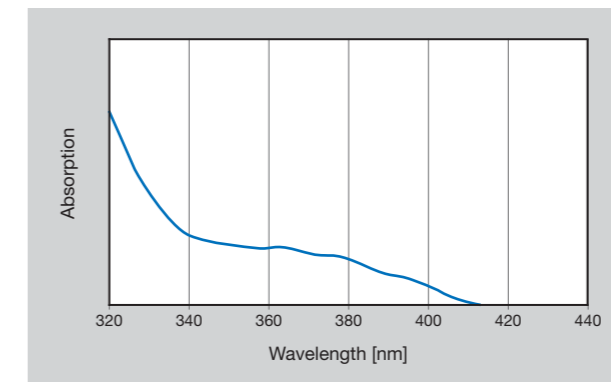
You can find more details on type-specific properties in the technical data sheets and material safety data sheets.

Our Engineering Department will be pleased to support you in technical application tests and questions resulting from processing DELO products. Please also refer to the DELO-KATIOBOND selection chart.

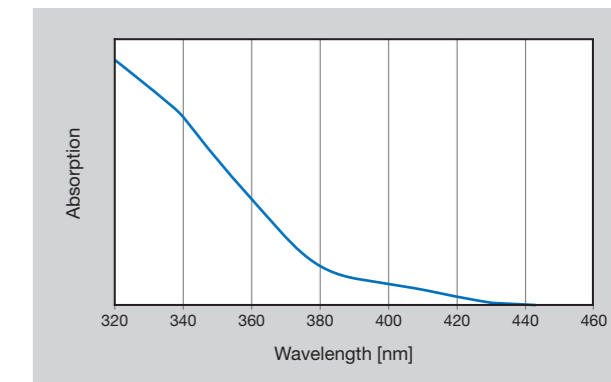
DELO-KATIOBOND are also photoinitiated, one-component and solvent-free adhesives. Contrary to the radical-curing DELO-PHOTOBOND acrylates, DELO-KATIOBOND are based on cationic-polymerizing epoxy resins curing completely after a minimum irradiation time even after irradiation is stopped. As a result, the light-activated types offer the possibility of preactivation. With this procedure two opaque components can be bonded. UV-curing DELO-KATIOBOND can be used as Dam&Fill® products for chip encapsulation. All DELO-KATIOBOND products have a completely dry surface after curing



Absorption spectrum of the photoinitiator (wavelength range from 320 to 400 nm) of the UV-curing DELO-PHOTOBOND in an acrylate matrix



Absorption spectrum of the photoinitiator (wavelength range from 320 to 440 nm) of the UV- and light-curing DELO-PHOTOBOND in an acrylate matrix



Absorption spectrum of the photoinitiator (wavelength range from 320 to 460 nm) of the UV- and light-curing DELO-PHOTOBOND in an acrylate matrix

¹⁾ No component permeable to UVA light
²⁾ Young's modulus not measurable
³⁾ Intensity meter: DELOLUXcontrol

Curing of photoinitiated adhesives

Curing with UV light or visible light in the specific wavelength range. DELOLUX LED curing lamps are especially suitable as

per the chart below. All standard DELOLUX HID lamps are also suitable.

Lampentyp	DELOLUX 80, DELOLUX 50, DELOLUX 20		
	365	400	460
DELO-PHOTOBOND GB310	++	-	-
DELO-PHOTOBOND GB345	++	-	-
DELO-PHOTOBOND GB368	++	+	-
DELO-PHOTOBOND PB437	+	++	-
DELO-PHOTOBOND 4494	+	++	-
DELO-PHOTOBOND AD491	++	++	-
DELO-PHOTOBOND 4436	+	++	-
DELO-PHOTOBOND 4442	+	++	-
DELO-PHOTOBOND 4468	+	++	-
DELO-PHOTOBOND 4496	+	++	-
DELO-PHOTOBOND 4497	+	++	-
DELO-PHOTOBOND AD414	++	++	-
DELO-PHOTOBOND AD494	+	++	-
DELO-PHOTOBOND SD496	+	++	-
DELO-DUALBOND AD4950	+	++	-
DELO-DUALBOND GE4910	+	++	-
DELO-DUALBOND AD4930	+	++	-
DELO-DUALBOND AD465	+	++	-

++ especially suitable
+ suitable
- not suitable

DELO-PHOTOBOND	1-component acrylates UV-curing · light-curing
DELO-DUALBOND	1-component acrylates light-/humidity-curing · UV-/light-/heat-curing
DELO-KATIOBOND	1-component epoxies UV-curing · UV-/light-curing · light-activated
DELO-DUALBOND	1-component epoxies UV-/light-/heat-curing
DELOMONOPOX	1-component epoxies heat-curing
DELO-DUOPOX	2-component epoxies cold-curing
DELO-ML	1-component methacrylates anaerobic-curing
DELO-CA	1-component cyanoacrylates fast-curing
DELO-GUM	1-component silicones highly flexible
DELO-PUR	2-component polyurethanes cold-curing · tough-elastic
DELOTHEN	Cleaners CFC-free
DELOMAT	Dispensing units precise
DELOLUX	Curing lamps intensive

Product selection

Application area	Casting and coating	Bonding of UVA- and VIS-permeable materials	Bonding of VIS-permeable materials	Bonding of opaque materials	Bonding, casting and coating with reliable curing in shadowed areas
Products	All DELO-KATIOBOND and DELO-PHOTOBOND products	All DELO-KATIOBOND and DELO-PHOTOBOND products	Light-activated DELO-KATIOBOND and light-curing DELO-PHOTOBOND products	Light-activated DELO-KATIOBOND products	DELO-DUALBOND products
Processing suggestion	Application ↓ Irradiation	Application ↓ Joining ↓ Irradiation	Application ↓ Preactivation ↓ Joining	Application ↓ Preactivation ↓ Joining	Application ↓ Joining ↓ Irradiation and/or heat/humidity

Our selection charts are a technical selection aid giving an overview of various product variants. We will be pleased to provide you with sales details, such as available container sizes, stock availability and minimum order quantities, on request.

The data and information provided are based on tests performed under laboratory conditions. Reliable information about the behavior of the product under practical conditions and its suitability for a specific purpose cannot be concluded from this. It is the user's responsibility to test the suitability of the product for the intended purpose by considering all specific requirements. Type, physical and chemical properties of the materials to be processed with the product, as well as all actual influences occurring during transport, storage, processing and use, may cause deviations in the behavior of the product compared to its behavior under laboratory conditions. All data provided are typical average values or uniquely determined parameters measured under laboratory conditions. The data and information provided are therefore no guarantee for specific product properties or the suitability of the product for a specific purpose. Verbal ancillary agreements are deemed not to exist.

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DELO



SELECTION CHART

DELO-PHOTOBOND

Acrylates
one-component · UV-curing · UV- and light-curing

DELO-DUALBOND

Acrylates
one-component · light-/humidity-curing · UV-/light-/heat-curing